



Geochronology and Zircon Hf Isotope Characteristics of the Lamprophyres from Shazi in Pingle, Northeastern Guangxi

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Citation: Yang et al., 2019. Geochronology and Zircon Hf Isotope Characteristics of the Lamprophyres from Shazi in Pingle, Northeastern Guangxi. *Acta Geologica Sinica* (English Edition), 93 (supp.2): 146–147.

Abstracts: It is widely known that the Indosinian and Yanshanian tectonic events are very important in South China and the tectonic stress field changed from compressional to extensional system (Jia et al., 2004). However, the tectonic attribute and tectonic setting in the Mesozoic is still unclear in South China (Zhou, 2003). The Nanling Mountains is believed to be the convergent area of the transformation in the Mesozoic in South China (Shu et al., 2009). The northeast Guangxi is located in the west of Nanling and a large amount of granites and a few mafic vein rocks are exposed in this area. It is known that the mafic rocks are products of regional extensional tectonic movement, which is of great significance for understanding the characteristics of continental lithosphere mantle and tectonic background during the process of diagenesis (Olsson et al., 2011). In this study, lamprophyres in northeast Guangxi are carried out for further understanding the tectonic attribute and tectonic setting in the Mesozoic in South China.

The lamprophyres in Shazi, Pingle County of northeast Guangxi was thought to be formed in the Yanshanian, which were dominated by the Guanying, Lipu and Baishi faults regionally. In this study, U-Pb dating and Hf isotope analysis were performed on 78 zircons from two lamprophyre samples. The ages are between 2711 to 163 Ma, with the youngest zircon for 163 ± 2 Ma, which is probably close to the emplacement age of the lamprophyre. Lamprophyres are generally produced in the tectonic setting of continental breakup; meanwhile, a large number of granites related to

extension were formed in South China in the Mesozoic, which is suggested that extension has ever been occurred in the Middle-Late Jurassic in South China. Zircons formed in the Neoproterozoic, Paleoproterozoic, Mesoproterozoic, Neoproterozoic and early Paleozoic might be captured during intrusion of lamprophyres. The seven oldest zircons performed in this study were formed in the Neoproterozoic, suggesting an unexposed Archean basement in the deep. Zircons in this study are concentrated in ~ 800 Ma, corresponding that the study area is located in the convergence zone of the Yangtze and Cathaysia blocks, which are probably related to the subduction-collision of the two blocks in the Neoproterozoic (Fig. 1).

Hf isotope analyses of 36 zircons from the lamprophyres in

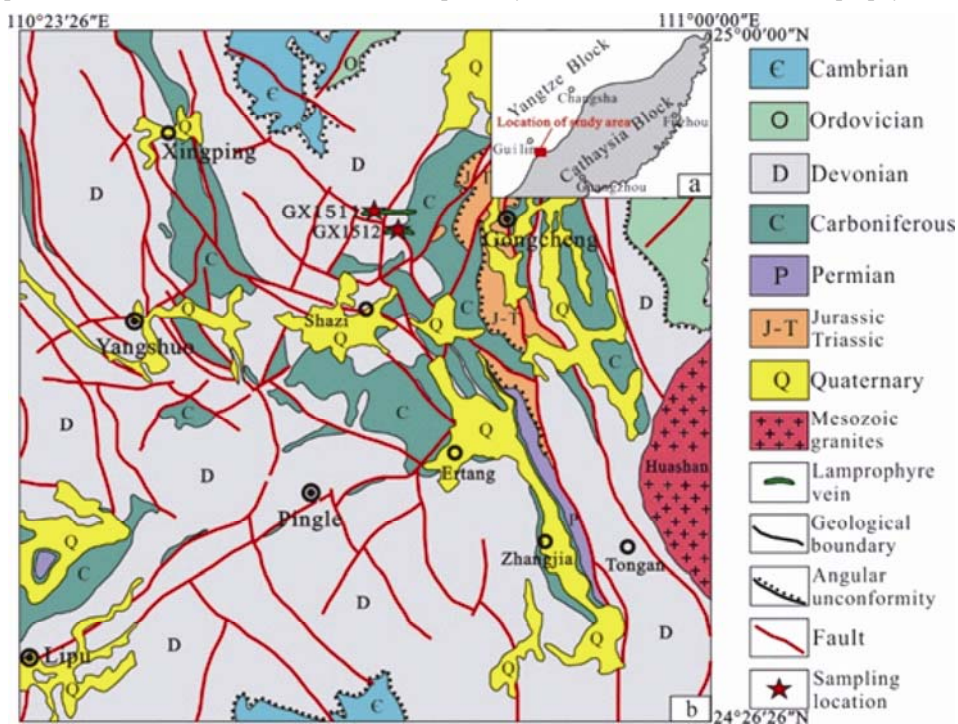


Fig. 1. Simplified geological map of northeastern Guangxi and the sampling locations

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this study shows that most of them are captured zircons. It is suggested that both of new crustal materials and recycling of ancient crustal materials in the Neoproterozoic. In the Paleoproterozoic, it was mainly the recycling of crustal materials from Neoproterozoic while in the Mesoproterozoic mainly the addition of new crustal materials. In the Neoproterozoic, it was mainly the recycling of ancient materials from the Paleoproterozoic, with the addition of new crustal materials. In the Early Paleozoic, it was mainly the recycling of crustal materials from Neoproterozoic to Paleoproterozoic. The Middle Jurassic zircons were probably crystallized from remelting magma of ancient crust. It is probably a hidden crust of Paleoproterozoic-Paleoproterozoic in the study area.

In conclusion, the formation age of the lamprophyres in Shazi, Pingling County of northeast Guangxi should be later than 163 Ma (the Early Yanshanian). Based on the geochronology and Hf isotopes of lamprophyres, it is probably an extension in the Middle-Late Jurassic and a hidden crust of Paleoproterozoic-Paleoproterozoic in the study area.

Keywords: northeastern Guangxi, lamprophyre, geochronology, Hf isotopes

Acknowledgements: This work is granted by the National Natural Science Foundation of China (Grant No. 41562005; 41862003) and Guangxi Natural Science Foundation (Grant No. 2016GXNSFAA380001).

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